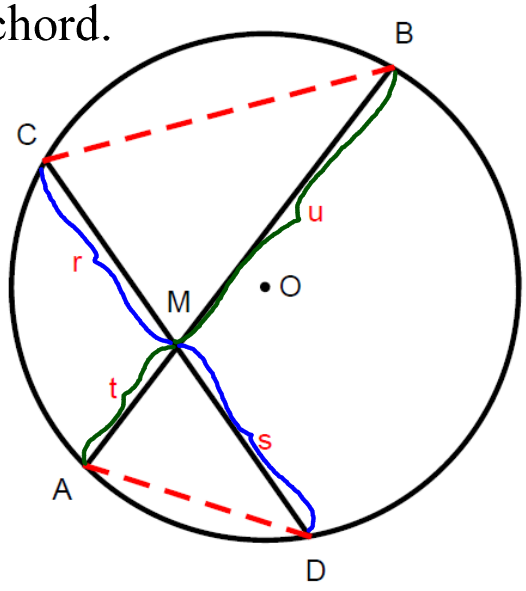
TWO CHORDS

When two chords intersect inside a circle, the product of the segments of one chord equals the product of the segments of the other chord.

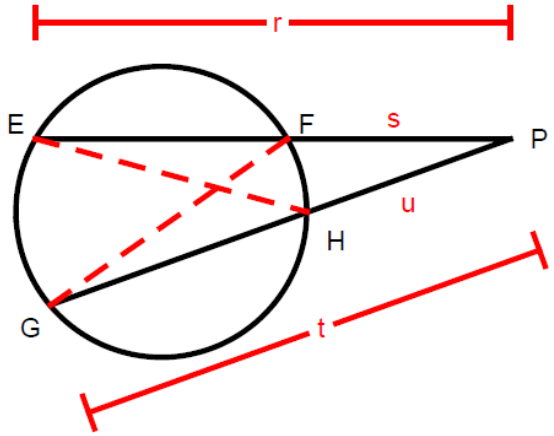
rs=tu

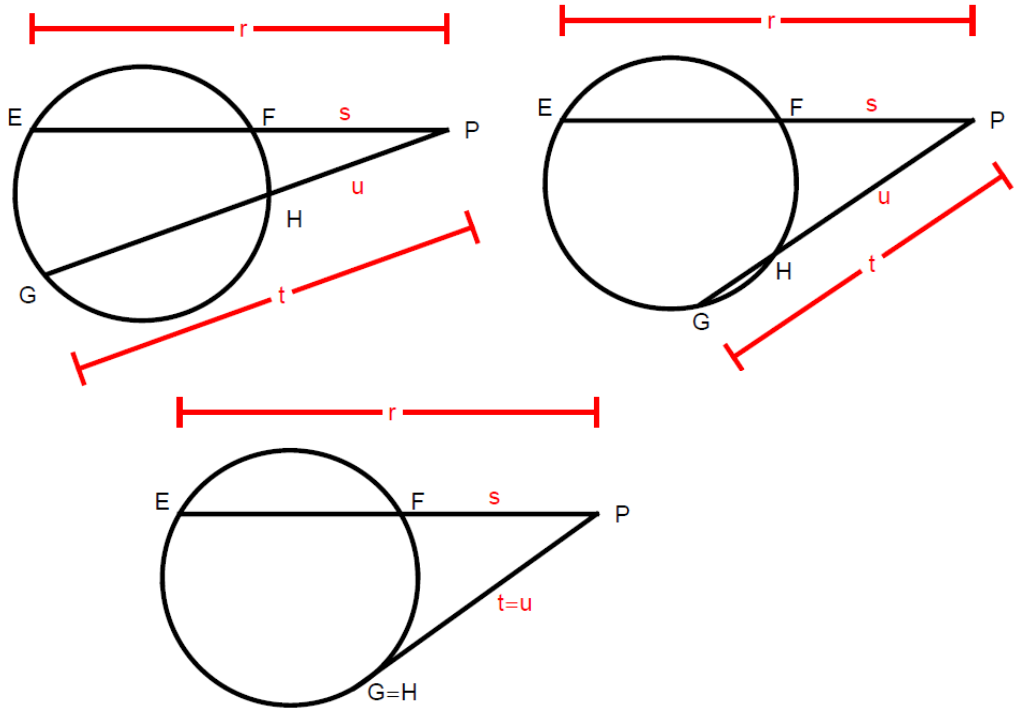


TWO SECANTS

When two secant segments are drawn to a circle from an external point, the product of one secant segment and its external segment equals the product of the other secant segment and its external segment.

rs=tu

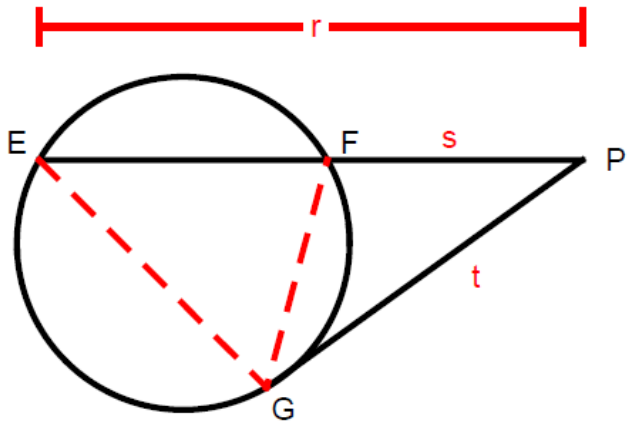


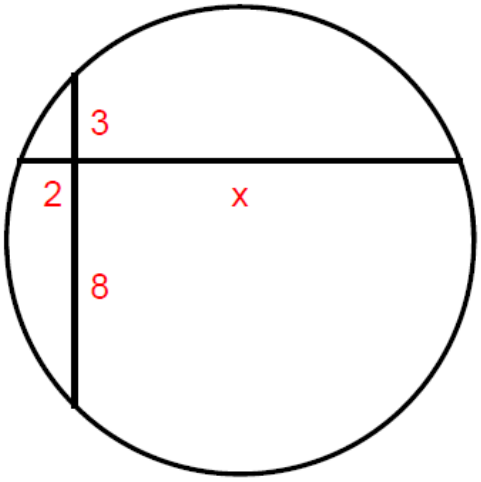


SECANT AND TANGENT

When a secant segment and a tangent segment are drawn to a circle from an external point, the product of the secant segment and its external segment is equal to the square of the tangent segment.

$rs=t^2$

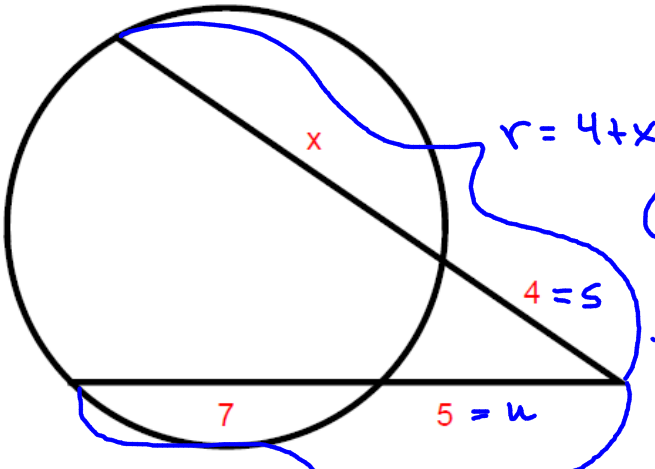




$r = 2$
$s = x$
$t = 3$
$u = 8$

$\frac{2x}{2} = \frac{24}{2}$

$x = 12$



$r = 4 + x$
$s = 4$
$t = 12$
$u = 5$

$rs = tu$

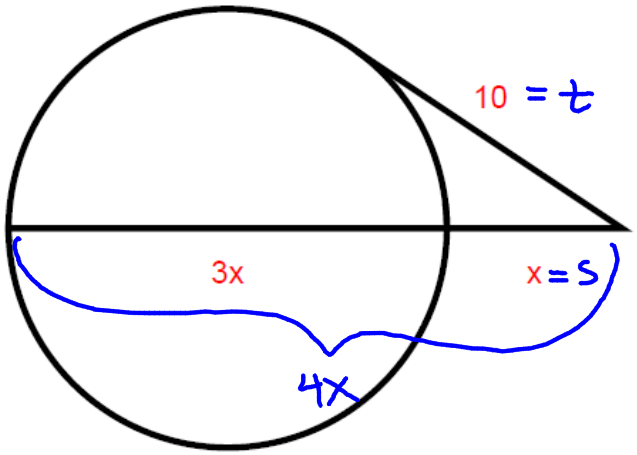
$(4+x)(4) = (12)(5)$

$16 + 4x = 60$

$-16 \quad -16$

$\frac{4x}{4} = \frac{44}{4}$

$x = 11$



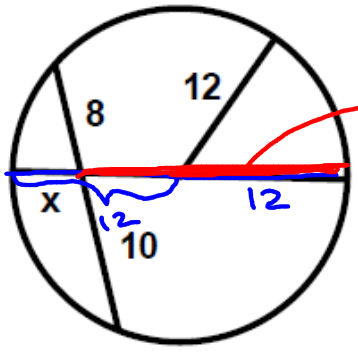
$rs = t^2$

$(4x)(x) = 10^2$

$\frac{4x^2}{4} = \frac{100}{4}$

$\sqrt{x^2} = \sqrt{25}$

$x = 5$



$r = 8$

$s = 10$

$t = x$

$u = 24 - x$

$rs = tu$

$80 = (x)(24-x)$

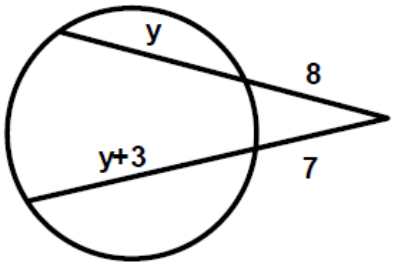
$80 = 24x - x^2$

$+x^2 \quad -24x \quad +x^2$

$x^2 - 24x + 80 = 0$

$(x-4)(x-20) = 0$

4 or 20



$r = y + 8$

$s = 8$

$t = y + 10$

$u = 7$

$(y+8)(8) = (y+10)(7)$

$8y + 64 = 7y + 70$

$-64 \quad -64$

$8y = 7y + 6$

$-7y \quad -7y$

$\boxed{y = 6}$